

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to add section headings and to add a Summary based on original claim 1. No new matter has been added, and it is respectfully requested that the amendments to the specification be approved and entered.

THE CLAIMS

Claims 5-12 have been canceled, without prejudice, and new claims 13-16 have been added based on, for example, the disclosure at pages 2-4 and in Figs. 1-3. No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered.

THE PRIOR ART REJECTION

Claims 5, 6, 9, and 10 were rejected under 35 USC 103 as being obvious in view of the combination of USP 5,336,136 ("Jacqui") and USP 3,245,279 ("Baker"); and claims 7, 8, 11, and 12 were rejected under 35 USC 103 as being obvious in view of the combination of Jacqui, Baker, and USP 6,099,432 ("Shirokoshi"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

According to the present invention as recited in new independent claim 13, a power tool comprises a housing with a rotation motor, an output shaft, and a reduction gearing connecting the motor to the output shaft.

In addition, according to new claim 13, the reduction gearing comprises a plurality of planetary gearing stages having a common ring gear supported in the housing, and each one of the planetary gearing stages includes a sun gear, a planet wheel carrier, and a plurality of planet wheel units engaging the ring gear and the sun gear.

Still further, according to new claim 13, each of the planet wheel units of at least one of the planetary gearing stages comprises two axially spaced spur gears fitted to a common spindle, one of the spur gears being rigidly secured to the common spindle, wherein the common spindle is rotatively journalled relative to the planet wheel carrier via a needle bearing.

It is respectfully submitted that the structure recited in new claim 13 provides a substantial step beyond the conventional type of planetary gearings in power tools. The first stage planetary gearing 13 in the present application is an example of a conventional type of planetary gearing. In this structure, the planet wheels 24 are rotationally journalled on stub axles 26 secured in a planet wheel carrier 25. This is the conventional

way of supporting planet wheels in planet type reduction gearings in power tools.

By contrast, according to the present invention as recited in new claim 13, a quite new approach to the planet wheel arrangement is used in the second stage planetary gearing (14). The second stage planetary gearing (14) is exposed to a heavier load than the first stage planetary gearing (13). The second stage planetary gearing (14) should thus have a stronger design, but the diameter of the ring gear (22) (and hence the size of the entire power tool) preferably should not be increased. The structure recited in new claim 13 achieves a stronger planetary gearing design allowing small wheels to be used by doubling the planet wheels (see wheels 36, 37) and fitting them to common spindles (see common spindle 38).

That is, as recited in new claim 13, each of the planet wheel units of at least one of the planetary gearing stages (e.g., 14) comprises two axially spaced spur gears (e.g., 36, 37) fitted to a common spindle (e.g., 38), one of the spur gears (e.g., 36) being rigidly secured to the common spindle, wherein the common spindle is rotatively journaled relative to the planet wheel carrier (e.g., 32) via a needle bearing (e.g., 39).

This structure introduces a new type of planet wheel bearing arrangement in which the needle bearings are moved from the planet wheels themselves to the common spindle to which the

planet wheels are fitted, thereby leaving more material in the planet wheels to strengthen the gear teeth.

The claimed present invention can thus achieve an increase in the torque capacity of a power tool power transmission without increasing the outer dimensions of the reduction gearing and the entire power tool.

It is respectfully submitted that the cited references do not disclose or suggest the structure recited in new claim 13.

Jacqui has been cited as disclosing as a housing with a rotation motor, output shaft, and reduction gearing, for a power tool. It is respectfully pointed out, however, that Jacqui does not relate to a power tool. Jacqui relates to "tubular motors . . . for driving a tube for winding up wind-up blinds or shutters, as well as for driving doors." Column 1, lines 14-17. Accordingly, it is respectfully submitted that the disclosure of Jacqui is not connected to power tools. By contrast, new claim 13 recites a power tool.

Baker, moreover, has been cited as disclosing (according to the Examiner) a planetary gearing in which each planet wheel unit comprises two axially spaced spur gears mounted on a common spindle and in which the spindle is rotatively journaled relative to the planet wheel carrier via a bearing located between the two spur gears. It is respectfully submitted, however, that the application, purpose, and problem solved by the

planet gear arrangement of Baker are not at all the same as those of the present invention - namely to accomplish a strong planet wheel design for (very) small-size gearings. Indeed, it is respectfully submitted that neither Jacqui nor Baker identifies the problem of planet wheel strength problem in connection with a small size planet gearing. In Baker there is no strict demand to keep the radial dimensions of the gearing small, and thus an arrangement with two axially spaced planet wheels secured to a common spindle and a bearing located between them is not a result of a requirement to obtain a strong planet wheel design. It is respectfully submitted that the massive ball bearings used by Baker indicate that there would be no option to locate them inside the planet wheels. And it is respectfully submitted that there is no suggestion in Baker of how to solve the problem of strengthening small-dimension planet wheels of a power tool reduction gearing by locating the bearings outside of the planet wheels themselves.

In summary, it is respectfully submitted that Jacqui and Baker do not disclose or suggest the structure recited in new claim 13 which introduces a new type of planet wheel bearing arrangement in which the needle bearings are moved from the planet wheels themselves to the common spindle to which the planet wheels are fitted, thereby leaving more material in the planet wheels to strengthen the gear teeth. As explained above,

this structure can achieve an increase in the torque capacity of a power tool power transmission without increasing the outer dimensions of the reduction gearing and the entire power tool.

It is respectfully submitted that Jacqui and Baker simply do not at all disclose or suggest the structure recited in new claim 13 whereby each of the planet wheel units of at least one of the planetary gearing stages comprises two axially spaced spur gears fitted to a common spindle, one of the spur gears being rigidly secured to the common spindle, wherein the common spindle is rotatively journaled relative to the planet wheel carrier via a needle bearing.

Accordingly, it is respectfully submitted that the present invention as recited in new independent claim 13, and new claims 14-16 depending therefrom, clearly patentably distinguishes over Jacqui, Baker, and Shirokoshi taken singly or in combination, under 35 USC 103.

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In view of the foregoing, entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

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